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정책학석사학위논문

Applying the Principle of Equity to Aid
Allocation Using the Synthetic Control
Method: Case Studies of Myanmar and
Nepal

합성통제방법론을 이용한 형평성 원칙 기반의
원조 배분:
미얀마와 네팔 사례를 중심으로

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Abstract

Applying the Principle of Equity to Aid Allocation Using the Synthetic Control Method : Case Studies of Myanmar and Nepal

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This paper will discuss key related concepts of equity and suggest how equity-based needs assessment can be and should be formally incorporated into aid policies of South Korea. Specifically, the empirical analysis will be conducted to address the following research questions: does the current distribution of development aid satisfy the equity standard? If not, what kind of factors could prevent recipient countries from receiving the “equitable” share of the aid? In this paper, the two types of aggregate-level incidents—economic sanctions and civil wars. As such, countries for the case studies in this paper will be drawn from a pool of Korea’s “Priority Recipient Countries” in Asia. Specifically, the effects of Myanmar’s economic

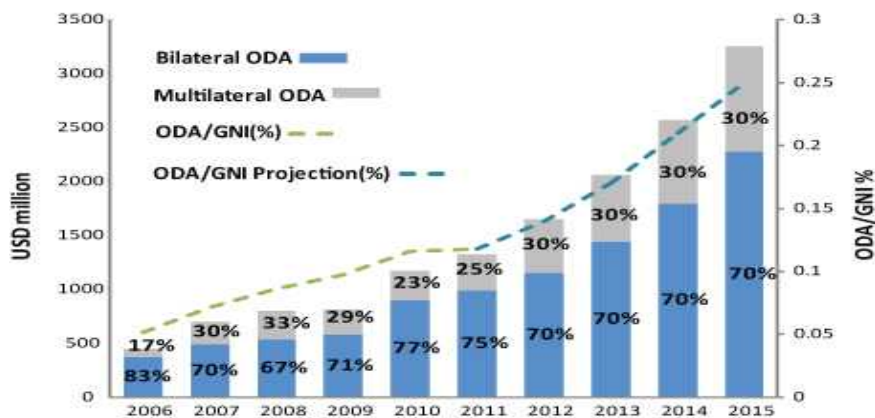
sanctions and Nepal's civil war on each country's net ODA will be analyzed, using the synthetic control method. Overall, based on theoretical discussions about equity and suggestions for how to build equity standards into ODA policy-making process, I will provide more specific estimation process for South Korea's ODA appropriation.

I. Introduction

1.1. South Korea as a Donor Country

An aid recipient less than two decades ago, Korea is now a growing influence in the field of international development as a donor. Korea has trebled its official development assistance (ODA) to USD 1,325 million per year, or 0.12% of its gross national income over the past five years and is committed to further doubling it by 2015, as shown in the graph below. In this regard, the OECD's first *Review of the Development Co-operation Policies and Programmes of Korea* emphasized that the government should strategically manage such steep increase “carefully” (OECD, 2012).

<Graph 1> Korea's official development assistance, 2006-2015



(OECD DAC Peer Review Report, 2012)

More importantly, over the last five years Korea has been increasing its aid to the least developed countries (LDCs), low-income countries (LICs), and heavily indebted poor countries (HIPC). Indeed, Korean government has designated twenty-six countries including those belonging to aforementioned categories as “strategic partner countries”. Out of twenty-six, eleven countries are located in Asia and about 50% of aid will be distributed with priority to ASEAN (Association of Southeast Asian Nations) members, assuming greater strategic importance in terms of allocating its aid resources.

<Table 1>

Priority Partner Countries in Asia			
1	Vietnam	7	Laos
2	Cambodia	8	Indonesia
3	Bangladesh	9	Myanmar
4	Philippines	10	Nepal
5	Sri Lanka	11	Pakistan
6	Mongolia		

1.2. Case Selection

Among those eleven countries, Myanmar and Nepal have been chosen for case studies for the following reasons. First of all, Myanmar was selected because it experienced full-fledged economic sanctions in the recent decades between late 1990s and 2000s. In this paper, economic sanctions have been used as an indicator that a

country with an experience of economic sanctions has been prevented from receiving the “equitable” share of aid—that is, the aid volume that the country would have received were it not for the sanctions—and thus requires more precise needs assessment through analytical tools like the synthetic control method.

As such, Laos, Indonesia, Cambodia, Bangladesh, Philippines, Nepal, Pakistan, and Mongolia were not selected as a country for case studies, since they have not experienced “full-fledged” economic sanctions in which case the official government of a whole country is targeted for the sanctions, whereas in other types of sanctions program, only specified individuals or groups are being designated as its target. In addition, sanctions against Pakistan were limited to an arms and military embargo, triggered by nuclear issue in the late 1990s.

The United States also imposed a trade embargo on the newly unified Vietnam immediately after the fall of Saigon in 1975 and the embargo remained intact until 1992 but again, it was limited to banning commercial sales to Vietnam; Also, even throughout the embargo period, due to the issue of American servicemen missing in Vietnam, the diplomatic relationship between the two countries could not be completely disengaged. For example, in 1988, the U.S. and Vietnam conducted their first joint field operations to search for information about US MIAs (Missing In Action) of the Vietnam War

during 1961–1965 period. Also, in 1991, Washington decided to open an office in Hanoi to help search for MIAs. At that time, the United States also presented “a roadmap for phased normalization of relations” (Weiner, 2007).

Secondly, Nepal was selected since it was the only country which experienced a “relatively” sustained/consistent civil war during the recent decades, 1990s-2000s. Here, a civil war serves as another indicator that a country with an experience of such internal conflict would have been prevented from receiving the “equitable” share of aid—that is, the aid volume that the country would have received were it not for the civil war—and thus needs more precise needs assessment via the aforementioned methodologies such as the synthetic control method. Sri Lanka also experienced 26-year long internal conflict beginning in 1983, but it can be characterized as highly intermittent and checkered. The Government of Sri Lanka was pitted against the Liberation Tigers of Tamil Eelam (the LTTE), an independent militant organization which fought to establish its own “Tamil” state in the north and the east of the island. Yet, the country’s internal struggle was periodically marked by attempts at peace talks and cease-fire agreements over nearly three decades.

Pakistan also went through the war in North-West Pakistan between the State of Pakistan and armed militant groups such as the Tehrik-i-Taliban Pakistan (TTP), al-Qaeda, and the Islamic State of

Iraq but such armed conflicts sparked by these terrorist organizations barely remained domestic and increasingly turned into international affair. Plus, later in the conflict, Pakistan had joined the US-led War on Terror, so it is quite difficult to consider this war in North-West Pakistan as a clear case of internal conflict.

Lastly, there were massive killings in Indonesia in 1965-1966, which almost pushed the country to the verge of civil war. Yet, not only it did not happen in recent decades and lasted only for several months, but also it consequently did not develop into full-fledged civil war.

1.3. Current Standards of Aid Allocation

In general, most of the discussion in international aid is dominated by “aid effectiveness”. Indeed, out of five criteria for aid policy arrangements, DAC members are recommended to consider “efficiency” and “effectiveness”, yet there is no mentioning about “equity”. Perhaps, “relevance”, which is also one of the standards for ODA assessment, can be interpreted as “adequacy” which, in turn, can be coupled with equity (Burch, 1998). Nonetheless, it is hard to deny the fact that equity among aid recipients are not explicitly mentioned in the DAC’s standards, which are widely adopted and followed by donor countries.

Similarly, a set of guidelines for drafting the Country

Partnership Strategy (CPS) has been proposed to establish both the direction and scope of South Korea's development assistance to those developing, impoverished countries. In those guidelines, however, the government barely discusses the issue of equity *among* developing countries. Rather, aid effectiveness and efficiency are very often the main standards for determining the size of aid to the aforementioned eleven countries. In this respect, this paper will argue that South Korea's aid policies should factor equity into their policy-making process—more specifically, when determining the size of ODA.

On the other hand, in the arena of social welfare and welfare economics, this issue of how to strike a proper balance between equity and efficiency has been at the heart of government's policy-making and assessment. In this regard, this paper will discuss key related concepts of equity and ultimately suggest how the second principle of equity can be and should be formally integrated into aid policies of South Korea.

In doing so, the cases of the two countries which had been deterred from getting as much aid as they need during certain time period due to aforementioned political-historical incidents—sanctions and civil war—will be analyzed to obtain the estimates of the aid “foregone” by using the synthetic control method. Once we get the estimates, we will analyze how to consider such losses and remedy them based on the principle of equity when appropriating aid budget

for corresponding countries, Myanmar and Nepal.

More specifically, the following literature review section will discuss the second principle of equity more in depth and show how its underlying core concept can be—and should be—applied to aid policy-making framework.

II. Literature Review

2.1. The Principle of Equity and Needs Assessment

Before we delve into the principle of equity, it is necessary to briefly examine the related concepts that are often discussed together in welfare economics: efficiency and equality in relation to equity.

In economic term, efficiency pertains to the optimal production and allocation of resources given existing factors of production.¹⁾ In welfare economics, efficiency or effectiveness also factors in as “redistribution strategies”. For example, those who are below the average income level but above absolute poverty line—that is, the level of income or other financial resources with which one’s basic needs can be fulfilled—are distributed with public benefits based on their rate of participation in government-sponsored job training programs and getting back into the job market. In other words, welfare system provides such “performance-based” assistance in order

1) There are different types of efficiency, but I will not delve into explaining each type in details given the purpose of this paper.

to efficiently allocate the government's resources, as it will be more efficient if those who could work (but eg. temporarily out of work) get the assistance.

Equity, on the other hand, is concerned with *in what way* or *to whom* resources are distributed throughout society. There are different types of equity and principles regarding the concept. Specifically, vertical equity is concerned with the *relative* income and welfare of the whole population. For instance, the principle of relative poverty is concerned with the fact certain segment of population in the society lives on less than, say, 50% of average income. Vertical equity may imply higher tax rates for high income earners. Meanwhile, horizontal equity is treating everyone in same situation the same and implies that those with identical income level should pay the same level of tax.

Now, let's take a look at equality concept. The key question that distinguishes the principle of vertical equality from that of horizontal equality is "compared to what or whom"? Horizontal equality compares only within "peer subgroups" that have similar needs or circumstances. For example, wage-based Social Security system is based on horizontal equality since one gets the same as everyone who made the same contributions but it cannot be regarded as vertical equality since one gets more than lower-wage workers. In this respect, *equity* (which is the subject of the next section and the

concept most critical to this paper) closely corresponds to a horizontal equality concept.

Most importantly, the second principle of equity, *needs-based* approach, is critical to this paper's primary objective—needs assessment of aid in lowest-income countries. Before delving into the second principle, however, consider how the needs can be the basis of the equity. Some, for example, view that an *equitable* share is proportional to what one deserves (Livermore, 1998).

Regarding this definition, however, a tough question remain as to how we can define the concept of “deserving” and thus measures one’s “comparable worth”.²⁾ However, it is important to understand that this concept does not mean one has to “earn” for it, especially according to the second principle of equity. To quote the commentary on this principle of equity by Jones (2009):

This [second principle of equity] means distribution of necessary goods on the basis of people's need, that is, proportional to the extent that they are missing them and nothing else. These are not things that should be 'earned' or 'deserved' through hard work, and lacking them can be seen as an outcome that is so bad that nobody deserves or merits it.

Basically, the second principle of equity posits that assistance

2) Indeed, the comparable worth is actually an equity/horizontal equality approach that has been originally developed in response to patterns of disparity in payments between male-dominant and female-dominant occupations.

should be provided as much as needs exist among most impoverished and marginalized individuals or groups—in the context of ODA, such people or groups can be regarded as the least developed countries (LDCs) or lowest-income countries.

Therefore, if we were to distribute ODA according to the second principle of equity, accurate needs assessment assumes great importance. Admittedly, each country will have different socio-economic, historical or cultural factors and conditions that have shaped its needs, so the assessment is bound to be difficult. Indeed, assessing such “additional” needs or damages might entail considerable administrative costs (e.g. conducting research to identify more needy countries due to experiencing specific barriers in receiving aid); Jones (2009) and Livermore (1998) also recognized the difficulty of diagnosing needs, especially if the task has to be done at a country-level. Thus, obviously, we cannot perfectly capture or diagnose the needs of each country; furthermore, even in the current aid distribution system, donors already consider certain macroeconomic and political conditions when they give out their aid.

Yet, more systematic and effective assessment is necessary in order to provide “equitable” share of ODA for the least developed countries. In this respect, synthetic control method, an analytical model that will be used in this paper, provides a cost- and time-effective tool to conduct customized needs assessment, as well as

the impact evaluation of economic sanctions and civil war on the amount of net ODA received by those countries.

All in all, this paper will examine how we could effectively, though not perfectly, carry out needs assessment and provide the aid volume corresponding to those needs of each recipient country as closely as possible if we were to incorporate the standard of equity in aid allocation. Moreover, based on the second equity principle, sanctions or civil war can serve as *indicators* that it is necessary to conduct needs assessment with analytical tools like the synthetic control method for recipient countries which have experienced sanctions or civil wars.

In general, the issue of equity in international aid is discussed more in terms of distribution within the recipient country rather than among or across recipient countries with different socio-economic situations. However, as Jones (2009) suggested, the equity among those developing countries can be a relevant and important issue as well. More specifically, when determining the aid volume, the idea of equity should be implemented under the principle that the aid designed to help recipients fulfill their basic needs such as food, housing, and health should be provided as much as those needs exist in recipient countries.

Thus, from equity perspective, aforementioned indicators such as the presence of economic sanctions or civil wars should be given

a particular attention, since those historical-political events have hindered the recipients from getting the “equitable” amount of aid that should have been given to satisfy their basic development needs. By integrating the principle of equity, we have to remedy such disparity by adjusting the size of ODA based on their true needs. In this respect, the following case of sanctions in Myanmar and that of civil war in Nepal will briefly discuss the history of each intervention and move on to conduct an empirical analysis of those two case studies by using the recently developed synthetic control method. Specifically, I will assess how much of aid has been foregone due to sanctions by constructing a control unit from a pool of countries with similar political-economic characteristics.

Another related issue that has to be discussed is whether ODA is effective to poverty reduction as it contributes to the country’s economic development. It should be made clear, however, that we are not discussing the degree of aid effectiveness as a standard for determining the amount of ODA.

In other words, the purpose of bringing up this issue here is not to compare the level of aid effectiveness of one recipient country to another; rather, I intend to simply ensure that official development assistance does have an “positive” impact on economic growth of developing countries, but again I would not be concerned with the magnitude of such effect varies by country or time period. That being

said, the following part will survey the existing literature on the positive impact of ODA. Ultimately, I will argue that given such positive influence of ODA on a recipient country's economic development, the equity-based proposition that aid "*foregone*" due to sanctions or civil wars should be compensated by considering it in subsequent aid allocation.

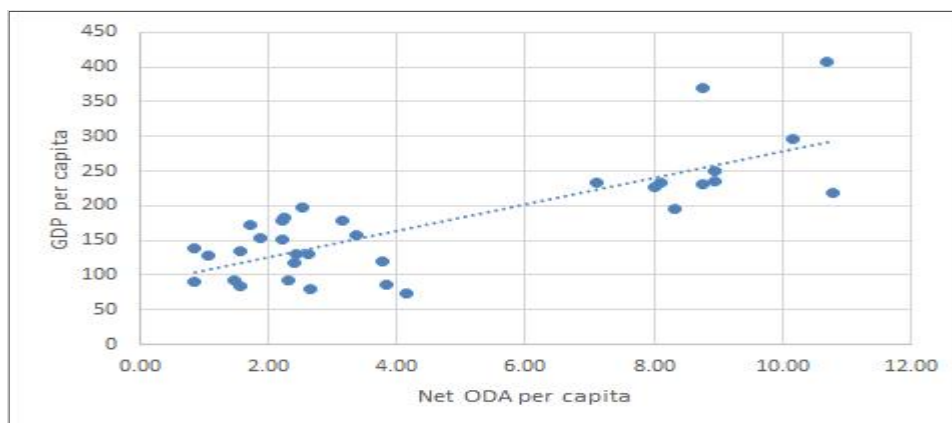
The impact of aid on poor countries' overall economies has been at the heart of debates associated with foreign aid. Generally speaking, whether ODA can help developing countries stimulate higher levels of economic growth or achieve macroeconomic stability depends on various factors—which tend to enhance or limit the aggregate impact of aid (Riddell, 2007). Furthermore, it takes time for aid to take an effect and more importantly, to be able to assess such impact.

Given these constraints, the range of discussion with regard to the purpose of this paper will focus on examining the correlation between the economic growth/development and ODA in two specific countries of our case studies, Myanmar and Nepal. More specifically, for this simple "check", major macroeconomic indicator such as GDP per capita will be used to see whether the aid has a positive or negative impact on each country's economic development during the pre-treatment period, respectively.

First of all, we will take a look at the case of Myanmar. The following graph shows a quite strong positive association between

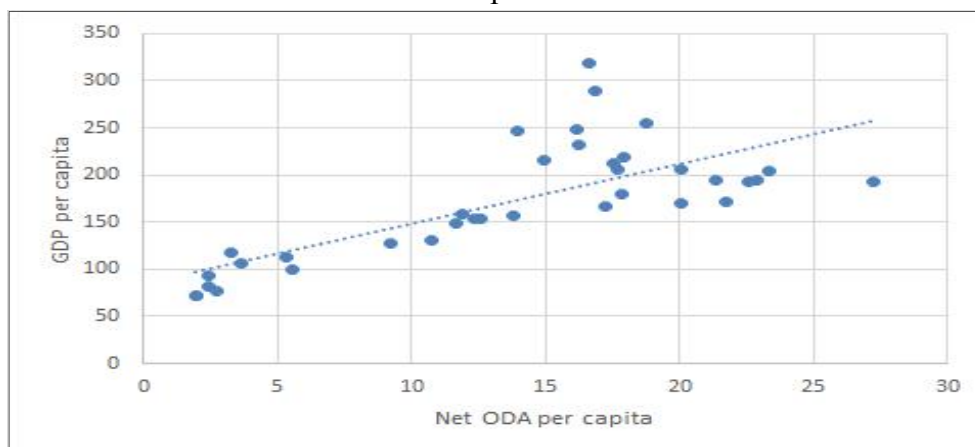
GDP per capita and ODA per capita in current USD during 1970-2003, with correlation coefficient of approximately 0.8.

<Graph 2>



Next is to check the positive effect of ODA on Nepal's economy. As in the case in Myanmar, the following graph shows a significant correlation between the level of GDP per capita and ODA per capita in current USD during 1970-2005, with a correlation coefficient of about 0.74.

<Graph 3>



Thus, we have seen that ODA does have an positive impact on developing countries' economy by varying degrees, obviously. But as I said earlier, that is not in our interest; actually comparing the aid effectiveness among countries would defeat the whole purpose of this paper, which is to consider equity, not just effectiveness, among developing countries.

2.2. Economic Sanctions: Myanmar

Since the end of the Cold War, economic sanctions have been used as a diplomatic instrument of US or other major international authorities such as United Nations. The assessment of their effects mostly remain controversial (Lopez et al.,).

By the early 2000s, a majority of the Western countries had joined the US drive to impose severe economic sanctions against Myanmar's military regime. In particular, despite some concerns about isolating Myanmar from the international economy, the United States went for a long-term sanction program, starting with its trade embargo in 1997 and subsequently launching a full-fledged sanction program during 2003-2004, which prohibited most of the investment and trade activities in order to deter Myanmar's ruling junta from committing political repression against its opponents.

Not all of the target countries experience economic sanctions at national-level. For example, the U.S. Department of the Treasury targets

specific personnel and groups in countries including Balkans, Congo (Democratic Republic), Iraq, Liberia, Sudan and Zimbabwe; specifically, they are forbidden from doing business with U.S. nationals and organizations, vice versa.

In these cases, the sanctions are implemented against political groups or organizations that promote terrorism or human rights violation, instead of the country's official government as a whole.

A few years after the U.S. sanction program had been implemented, most international development agencies also followed the suit, suspending their operations and pulling out of Myanmar's major cities.

Such intervention by the Western democratic countries continued until 2010, when the new political leader, Thein Sein, came into power and implemented a series of economic reforms— although considered somewhat limited in its scope. Overall, although the goal of sanctions by the Western countries was to sabotage totalitarian military regime, but the burden of cutting out any transactions or capital flows fell upon the shoulders of Myanmar's people; they lacked economic sources to fulfill their daily, basic needs.

The following is a timeline of sanctions on Myanmar during 2004-2010:

<Table 2> Timeline of Myanmar Sanctions

<p><i>April 2004</i> - Due to the political oppression in Myanmar, EU extends travel sanctions and asset freeze. Non-humanitarian aid and high level bilateral visits remain suspended.</p> <p><i>May 2004</i> - The opposition party refuses to participate in convention to write a new Burmese constitution while its leaders are under house arrest; Convention is suspended indefinitely by the military junta in July 2004.</p> <p>July 2004 President Bush signs legislation that extends the import ban on Burma for another year.</p> <p><i>Oct 2004</i> - Prime Minister Khin Nyunt is ousted and replaced by a hardliner, Lieutenant General Soe Win.</p> <p><i>Oct 2004</i> - EU Council expands the travel ban and prohibits granting of financial loans or credit to Burmese state-owned enterprises. EU also bans new investments in state-owned enterprises</p> <p><i>Nov 2004</i> - Opposition groups claim Burmese junta extended Suu Kyi's house arrest for another year.</p> <p><i>Apr 2005</i> - EU extends restrictive measures for another year.</p> <p><i>Apr 2006</i> - EU Council extends restrictive measures against Burma.</p> <p>May 2006 Military junta extends Aung San Suu Kyi's house arrest by another year.</p> <p><i>Aug 2006</i> - President Bush signs legislation extending the 2003 Burmese Freedom and Democracy Act three more years.</p> <p><i>Jul 2007</i> - EU threatens to impose a full embargo on Myanmar.</p> <p><i>Sep 2007</i> - US imposes new sanctions against the ruling military junta in Myanmar.</p> <p>2008 - US broadens the scope of Myanmar sanctions; Bush administration froze the assets of state-owned companies in Myanmar supporting the military junta, which oppresses pro-democracy dissidents.</p> <p>2009 - UK threatens to impose new sanctions on Myanmar</p>

2.3. Civil War: Nepal

The Nepali Civil war, also referred as “the People’s War” by the Maoists, started in 1996, when the Communist Party of Nepal (Maoist) (CPN (Maoist)), after being exempted from participation in a national election, rebelled against the government.

The following is a brief timeline of the conflict between the Government of Nepal and CPN (Maoist):

<Table 3>

<i>1994</i> - The Communist Party of Nepal (Maoist) is founded by Pushpa Kamal Dahal, known by his nom de guerre, Prachanda.
<i>Feb 1996</i> - Maoists, who oppose the Himalayan country's constitutional monarchy, launch a "people's war" to establish a single-party communist republic.
<i>1996-2000</i> - The Maoist launch a low-intensity insurgency and target ill trained and poorly armed police of the government.
<i>2001-2005</i> - The Maoists turns the conflict into a full-scale guerrilla war by attacking army. Their attacks begin to target district capitals.
<i>Feb 2005</i> - King Gyanendra assumes absolute power, swearing to exterminate the Maoists.
<i>Sept 2005</i> - Maoist rebels pronounce a unilateral ceasefire but royalist government turns it down.
<i>Nov 2005</i> - Maoists form an alliance with the seven main political parties to end royal rule.
<i>April 2006</i> - King Gyanendra gives up absolute power after widespread protests.
<i>June 2006</i> - New government agrees with Maoists to dissolve parliament and form interim administration that includes rebels.
<i>Nov 2006</i> - Prime Minister Koirala and rebel chief Prachanda sign a peace deal, ending a civil war that killed more than 13,000 people.

In 2006, the establishment of the Comprehensive Peace Accord (CPA) by the two parties put an end to a internal conflict that left more than 13,000 people dead and 1,300 missing.³⁾

Historically, Nepal had been ruled by royal dynasties until the early 1990s when several political parties emerged to launch a pro-democracy movement, the Jana Andolan (People's Movement). In 1991, after a period of political turbulence, multi-party democracy was in place.

Such landmark political changes in the early 1990s increased popular expectations about greater equality and public participation, but despite some improvements in the economy, the living conditions of most people remained poor. Indeed, according to some analysts, deep-rooted socio-economic conditions that made the country susceptible to an internal conflict already existed in Nepal and precipitated the emergence of insurgency as a political device to “channel those longstanding grievances” (Mikesell, 1993).

In 1995, the newly named Communist Party of Nepal (Maoist) (“CPN (Maoist)”) set the plans to launch an armed resistance, the so-called “People's War”, against the government in power. In 1996, the CPN Maoist submitted a list of 40-point demands to the Government of Nepal which included a wide range of social,

3) The Informal Sector Service Centre (INSEC), a leading human rights organisation in Nepal, recorded 13,236 people killed: INSEC Conflict Victim Profile (August 2010), available from www.insec.org.np/victim/.

economic and political agendas; then, it announced that a militant struggle would follow if those demands were not accepted by the government. A week later, on 13 February 1996, the CPN (Maoist) embarked on an armed rebellion against the official Nepalese government.

Over the following decade, what started out as an insurgency in the rural area of Nepal turned into a full-fledged and entrenched armed conflict that plagued the whole country. Violence and abuses by both parties—Government Security Forces and by the CPN (Maoist)—devastated villages and cities as the conflict ensued; civil war-related deaths were reported in all but two of Nepal's 73 out of 75 districts.

In addition to generating casualties and “missing” people, a vast number of people were directly or indirectly influenced by the war. Many households were displaced from their homes. Health, education and other basic public services were stalled due to large-scale disruptions by the conflict. Not surprisingly, economic hardships were further exacerbated (OHCHR, 2012)

In this regard, several researches have been conducted to assess the economic costs of the decade-long armed conflict. Pradhan (2009), for instance, suggested that a sharp increase in government spending on defense and internal security against the Maoist insurgency caused a negative impact on Nepal's economy. Yet, this

study only focused on quantitatively examining the correlation between defense spending and investment, but did not discuss how the civil war led to a decrease in official development aid, which had a significant association with economic development of Nepal, as shown above.

Ra and Singh (2005), on the other hand, sought to assess the economic costs of Nepal's civil war by primarily focusing on how internal conflict has an adverse impact on "development expenditure," which in turn negatively affected other macroeconomic indicators of economic growth of the country.

2.3. Review of Methodological Approaches

Now, we will take a closer look at the previous studies conducted to estimate the economic impacts of sanctions and the existing methodologies that have been used to assess those impacts.

Many researchers have attempted to assess the impact of the sanctions on the economic development of the developing countries.

A methodological approach that has been frequently used to examine "large-scale but infrequent interventions" is comparative case studies. However, a major weakness of this mainstream approach lies in the fact that the selection of the comparison units is not sufficiently *formalized* and thus relies on "vague statements of affinity between unaffected units and the set of comparison units" (Abadie,

2010, p. 2-3).

Also, Giumelli and Ivan (2013) conducted comparative case studies to assess the impact of the EU sanctions by examining four different countries that had been classified as the target of EU's sanctions policies. Specifically, the study found that the EU sanctions did not incur a critical damage to Myanmar's economy, since the market leverage of EU had been not so significant, compared to that of the US or China. Meanwhile, the authors does raise an interesting concept, which seemingly echoes the underlying idea of the synthetic control method—the *counterfactual*: “the lack of investment opportunities that Myanmar suffered because of sanctions...deprives economies of wealth that they still do not have” (Giumelli and Ivan, 2013).

On the other hand, some studies tried to assess the impact of sanctions by focusing on a particular sector, which is considered to have suffered most from the trade embargo implemented by the US and its allies. Kudo (2005), for instance, examined the impact of US sanctions on the Myanmar's garment industry, based on the observations that the import ban damaged the garment industry most. Since reliable statistics on the industry were hardly available, the author tried to approximate the impact by examining patterns of the proxy indicators such as export value/volume, CMP charges, and Capacity Utilization.⁴⁾ Similarly, one of the data analysis demonstrated

that Myanmar's garment sector exported nearly half of its products to the US and more than 80% of US imports from Myanmar had been clothes (Kudo, 2005).

Moreover, in case of methodologies used in studies on the economic effects of civil war, the aforementioned research conducted by Pradhan (2009) used a simple Harrod-Domar growth model to estimate the effect of the increase in defense spending on economic growth. Based on this methodological approach, he suggested that between 1996 and 2006, the opportunity cost of the conflict in terms of lost output is estimated to be about 3 percent of Nepal's current GDP.

To look at methodological aspect of another previously discussed study on the economic impact of internal conflict in Nepal, Ra and Singh (2005) applied the NMM (Nepal Macroeconomic Model), a medium-sized annual Keynesian model under three generic "scenarios"—*no-conflict*, *conflict*, and *high conflict*—to carry out the scenario analysis.⁵⁾ There were 20 behavioral equations, and 17 identities in the NMM. Of the 59 variables, 37 are endogenous and 22 exogenous. Also, the authors selected five building blocks in the NMM: final demand, prices, credit and money, government, and the balance of payments blocks. The analysis assumed that a "shock",

4) See Kudo (2005) for more detailed explanation about those indicators.

5) See Ra, S. and C.Y. Rhee. 2005. Nepal Macroeconometric Model. NRM Working Paper Series No.1. Kathmandu: ADB.

such as a decline in development expenditure, affects the a country's economy through the propagation mechanism across the 5 building blocks. In consideration of such shock, all the variables were designed to undergo a dynamic process until the economy found a new equilibrium with values for each endogenous variable. Given the baseline estimates of the NMM, the analysis estimated that 1% increase in development expenditure results in 1.57% increase in private fixed investment, 0.65% increase in public fixed investment, and 0.18% increase in public consumption.

Overall, as you can see, most of the aforementioned studies based on existing methodologies, however, fall short of not only applying the equity concept but also providing a valid empirical evidence for estimating the magnitude of the economic impact via analyzing the volume of ODA. Then, the question remains about how we can estimate the size of the effects since it is quite challenging to infer “how the outcome of interest would have evolved in the affected country in the absence of the intervention” (Abadie, 2011, p.3). Indeed, the devastating effects of the civil war in Nepal plagued the entire country but it is difficult—almost implausible—to assess the aggregate impact of the economic-political incident. In a similar vein, attaining a country-level control unit to assess the macroeconomic effect of sanctions imposed on Myanmar during the seven-year long period has been deemed as a daunting task. With respect to these

shortcomings of existing inferential methods—especially traditional regression analysis, the synthetic control method can provide two important advantages: “transparency” and “safeguard” against *extrapolation*. Furthermore, As briefly mentioned above, the synthetic control analysis reflects the core idea of a counter-factual framework, which asks us to consider what would have happened if the condition contrary to the truth had been obtained.

For instance, in their case study of the Basque country to estimate the economic costs of political conflicts, Abadie and Gardeazabal (2003) confirmed the difficulty of knowing “how economies would have evolved in absence of political conflicts”. In addition, when the units of observation are a small number of large entities, no single unit alone can provide a good comparison for the unit affected by the intervention.

In order to address such challenges, the synthetic control method (Abadie and Gardeazabal, 2003; Abadie, Diamond, and Hainmueller, 2010) have been devised and applied to several case studies in various settings, from terrorist conflicts in the Basque Country to Rwanda’s one-stop business registration, among others.⁶⁾ In particular, the synthetic control method came up with an innovative approach to remedy the aforementioned difficulty of obtaining

6) See Abadie and Gardeazabal (2003) on the relationship between terrorist conflicts and GDP per capita; see Gathani et al. (2013) on the impact of Rwanda’s one-stop business registration center.

sufficient degree of similarity between the affected and unaffected unit; through a linear combination of unaffected units often provides a more accurate comparison than any single unaffected unit by itself. The synthetic control methodology seeks to formalize the selection of the comparison units using a data driven procedure.

This formalization—whose process will be explained step-by-step later in the application section—also paves a way for more precise quantitative inference in comparative case studies. In other words, the synthetic control methodology can serve as a quicker and cost-effective alternative “that can be applied to policy changes with aggregate country-level effects and *easily replicated to similar policy changes in other countries*” (Gathani, Santini and Stoelinga; 2013). As such, this innovative methodology will be applied to the aforementioned two different case studies of Myanmar and Nepal.

III. Conceptual Framework

Overall, equity principle provides a theoretical framework for considering the aid foregone due to certain political-historical incidents that this paper define as country-level indicators that call for needs assessment via analytical tools like synthetic control method. Ultimately, by doing so, this equity-based needs assessment should play a key role as one of criteria for determining aid volume for the least developed countries—in the case of this paper, Myanmar and

Nepal. The following are my two propositions based on the second principle of equity, using empirical research method:

Proposition 1: Based on the second principle of equity, the fact that Myanmar has experienced economic sanctions should be considered as a key indicator that needs assessment should be conducted in order to estimate the amount of aid “foregone”. Specifically, unfulfilled needs for aid during the period should be reflected on the subsequent aid allocation by donor countries. In particular, the South Korea should increase the amount of its ODA to Myanmar by the needs assessed through the synthetic control method.

Proposition 2: Based on second principle of equity, the fact that Nepal has experienced civil war/internal conflict should be considered as a key indicator that needs assessment should be conducted in order to estimate the amount of aid “foregone”. Specifically, unfulfilled needs for aid during the period should be reflected on the subsequent aid allocation by donor countries. In particular, the South Korea should increase the amount of its ODA to Nepal by the needs assessed through the synthetic control method.

IV. Analysis: the Synthetic Control Method

As briefly mentioned above, it is necessary to discuss more in details the process of selecting the relevant data and using it to apply the *synth* to the case of each country's economic sanctions.

4.1. Myanmar

Here, we intend to construct a “synthetic” Myanmar that mirrors the values of the economic development before the sanctions. In more “technical” terms, the synthetic Myanmar is made by the linear combination of the countries in the donor pool that most closely resemble Myanmar with regard to key country characteristics during the pre-sanction phase. Hence, in the following section, data and contextual requirements will be discussed along with the step-by-step explanation on how key properties of the relevant data can be factored into the process.

The following provides a snapshot for the process of creating the synthetic control unit, starting from identifying the key variables to plotting the trends of the outcome variable for both the treated and synthetic comparison unit.

The first step is to define the key variables of interest. In the context of this study, the outcome/response variable refers to net Official Development Assistance in constant 2012 USD. Indeed, there are many “variants” of net ODA depending on whether the monetary unit is set as constant or current; US dollars, local currency, or

PPP-based international dollars. Each version has some advantages and disadvantages, but since the synthetic control method is “data-driven process” and thus, the specific form of the outcome variable was determined more by the issue of data availability than by the distinct function.

The next step pertains to identifying the time period over which the Root Mean Square Prediction Error (RSMPE) is minimized. Before getting into discussion about the actual process, it is helpful to grasp the time-related terms that input period refers to the pre-intervention period, which corresponds to pre-sanction phase from 1999 to 2003. The data for the relevant indicators were available since 1999, so it is fair to say that the length of the pre-intervention period in this case was largely determined by the data availability.

Indeed, according to data and contextual requirements articulated by Abadie (2011, p. 4), in order to determine the proper input period, it is necessary to identify the period over which the difference between the actual Myanmar and synthetic one is minimized. Again, here you can see that the data availability serves as an ultimate determinant (or rather “constraint”) of the period. As an example, Abadie excluded the year 2010 and the impact of Rwanda’s second major reform package from the analysis because business registration data was not available for some of Rwanda’s comparison units—that is, countries in the donor pool.

In the third step, we have to select the predictor variables—key characteristics that play an important role in determining the volume of ODA given and received by Myanmar. In case of Myanmar, the pool of predictors was quite limited due to a number of missing values in the dataset. I primarily used determinants of the country's macroeconomic structure (eg. agriculture/industry/services, valued added in % of GDP), that is, sectoral composition, since the income level (GDP per capita) of a country is supposed to be one of principal factors in assessing the needs of a recipient country and determining aid allocation accordingly. In particular, agricultural sector has been a major source of income in Myanmar, so factoring agriculture, value added in % of GDP into constructing the Synthetic Myanmar was crucial.⁷⁾

Furthermore, To consider the demographic dimension, I included net ODA per capita as predictor variable, which is also closely related to the total aid volume delivered to recipient countries. Net ODA in constant 2012 USD of a particular year—more precisely, the year right before the imposition of sanctions—was used to minimize the prediction error by constructing the synthetic unit that exhibits a similar trajectory of the dependent variable during pre-sanctions period.

7) Industry, value added (% of GDP) was not included as predictor variable due to the data availability issue.

In another version of the Synthetic Myanmar in which case trade-related predictor variables have been used to construct the synthetic unit, export volume index and import volume index from the World Bank Database were included as predictor variables in order to reflect the basic yet fundamental effects of sanctions on trade dimension (World Bank, 2016).

Lastly, we identify a pool of potential control countries from which the synthetic Myanmar is created—that is, the donor pool. We establish the donor pool using the three criteria. For example, the donor pool should consist of countries without the experience of sanctions. Thus, I excluded the countries who have been classified as the target of the sanctions imposed by at least one of the following three entities—UN, EU or the United States.⁸⁾ Also, to prevent bias or “overfitting,” I filtered the countries by income-level on the World Bank’s database; as a result, only those that are classified as “low-income” or “lower-middle income” countries by the World Bank have been included as potential comparison units. The following two tables show averages of predictor variables during the pre-sanctions period for each country included in the donor pool, respectively.

8) These three entities (in case of US, the Department of Treasury) have been considered as major implementers of sanctions. Not surprisingly, their actions have had a significant impact on key diplomatic decisions (eg. whether to sustain their economic ties such as trading).

<Table 4>

	Donor Pool Countries	Averages (1999-2003)			oda(2003)
		agriculture	oda_pc	services	
1	Armenia	26.60	77.77	35.69	3.29E+08
2	Bangladesh	22.63	8.58	53.70	1.85E+09
3	Benin	26.03	34.74	41.57	3.94E+08
4	Bhutan	26.46	113.70	36.03	1.06E+08
5	Bolivia	15.13	80.43	55.61	1.22E+09
6	Burkina Faso	35.62	32.67	43.40	7.26E+08
7	Burundi	46.91	19.98	36.42	3.05E+08
8	Cameroon	22.51	33.44	44.82	1.15E+09
9	Central African Republic	53.56	20.27	32.23	6.79E+07
10	Chad	39.38	22.69	45.24	3.36E+08
11	Comoros	40.58	42.60	47.67	3.25E+07
12	Congo, Rep.	6.40	23.65	28.92	9.11E+07
13	Djibouti	3.55	98.14	80.84	1.05E+08
14	Egypt, Arab Rep.	16.68	19.16	49.74	1.31E+09
15	El Salvador	9.98	35.11	58.12	2.49E+08
16	Georgia	22.35	56.98	54.28	2.99E+08
17	Guinea	22.76	26.47	44.11	3.35E+08
18	Guinea-Bissau	45.23	59.72	39.49	2.00E+08
19	Guyana	31.66	130.15	39.60	1.28E+08
20	Honduras	14.52	86.51	54.34	5.21E+08
21	India	22.38	1.32	51.93	8.10E+08
22	Indonesia	16.23	7.77	38.98	2.38E+09
23	Kenya	30.85	13.83	51.97	6.81E+08
24	Lesotho	12.58	29.67	52.34	1.02E+08
25	Madagascar	29.60	24.13	55.93	7.22E+08
26	Malawi	37.62	38.29	44.82	6.88E+08
27	Mali	36.85	34.50	39.99	7.49E+08
28	Mauritania	35.36	96.37	37.87	3.42E+08

29	Morocco	16.56	17.27	55.41	7.59E+08
30	Mozambique	24.79	62.82	53.21	1.42E+09
31	Myanmar	55.87	2.31	32.82	1.71E+08
32	Nepal	39.18	16.02	41.23	6.26E+08
33	Niger	39.56	24.27	43.24	6.40E+08
34	Nigeria	37.27	1.74	23.09	3.99E+08
35	Pakistan	24.75	9.24	51.48	1.41E+09
36	Papua New Guinea	37.64	40.73	23.85	4.78E+08
37	Philippines	13.65	7.84	52.12	9.73E+08
38	Rwanda	37.12	41.39	49.08	4.44E+08
39	Senegal	17.87	45.50	57.90	6.09E+08
40	Sierra Leone	53.66	60.33	29.82	4.38E+08
41	Solomon Islands	33.10	119.59	54.40	1.43E+08
42	Swaziland	11.14	24.92	43.83	5.33E+07
43	Tanzania	33.09	35.99	46.60	2.30E+09
44	Togo	53.66	11.59	45.55	6.56E+07
45	Uganda	29.72	32.47	47.53	1.31E+09
46	Vanuatu	26.97	185.36	62.61	5.89E+07
47	Zambia	18.24	65.74	55.27	1.02E+09

4.2. Nepal

In this section, we will go through the synthetic-unit-building process similar to that of Myanmar.

First of all, the variable of our interest in Nepal's case is net ODA in current USD. Due to the decade-long civil war, the amount of aid received declined during the internal conflict. We will estimate the amount "foregone" by constructing the synthetic unit and compute the "gap" between the treated and synthetic units.

Secondly, identifying the time period over which the Root Mean Square Prediction Error (RSMPE) is minimized. Before getting into discussion about the actual process, it is helpful to grasp the time-related terms that input period refers to the pre-intervention period, which corresponds to pre-sanction phase from 1991 to 1995.

Third step involves selecting a proper set of predictor variables. As in the case of Myanmar, I used agriculture, industry, services, value added in % of GDP respectively to factor sectoral distribution of Nepal into constructing its synthetic unit. Similarly, ODA per capita was used as a predictor variable to consider demographic characteristic with regard to the amount of ODA. In addition, GDP per capita in current USD was added to reflect the level of economic development of Nepal, which has a critical association with the aid volume.⁹⁾

9) GDP per capita could not be used as one of predictor variables for Myanmar due to the limited data available.

Lastly, it is important to accurately identify the donor pool. In order to prevent bias, we first narrowed potential control units to countries classified as “low-income” and “low-middle income” by the World Bank.

Next, I selected countries that have not experienced any civil war—an intervention of our interest—during the output period as defined above. Based on this criterion, some of the low-income countries have been dropped from the pool. Togo, for instance, was excluded due to its civil war. Sierra Leone was also ruled out due to its civil war which lasted from 1991 to 2002. Burundi also could not be a potential control unit for the Synthetic Nepal, because of its ethnic conflict since 1993. Chad did not become a part of the donor pool given its 2005-10 civil war. For similar reasons, Guinea-Bissau, Guinea, Somalia, Uganda, Zimbabwe, Tanzania, South Sudan, the Democratic Republic of Congo, Sri Lanka, Niger, Liberia, Ethiopia, and Mozambique have been excluded from the donor pool.

<Table 6>

	Donor Pool Countries	Averages (1991-1995)					oda(1994)
		agriculture	industry	services	oda_pc	gdp_pc_current	
1	Armenia	38.90	36.91	24.19	33.08	433.95	1.91E+08
2	Bangladesh	27.60	23.38	49.01	14.35	295.01	1.74E+09
3	Benin	33.70	12.73	53.57	48.75	348.92	2.56E+08
4	Bhutan	33.46	29.36	37.18	124.40	504.20	7.31E+07
5	Bolivia	16.69	32.83	50.48	82.39	807.52	5.61E+08
6	Burkina Faso	32.83	21.11	46.07	46.93	252.08	4.33E+08
7	Cameroon	24.01	30.21	45.78	44.87	845.21	7.30E+08
8	Central African Republic	46.16	21.50	32.34	54.21	382.75	1.68E+08
9	Comoros	39.36	11.67	48.98	106.76	529.08	3.87E+07
10	Congo, Rep.	10.97	39.44	49.59	65.82	893.43	3.62E+08
11	Cote d'Ivoire	29.10	22.72	48.18	72.55	773.04	1.59E+09
12	Djibouti	3.37	16.71	79.92	184.38	751.64	1.29E+08
13	Egypt, Arab Rep.	16.90	32.94	50.16	55.03	787.34	2.69E+09
14	El Salvador	15.30	29.47	55.23	62.32	1307.04	3.05E+08
15	Georgia	51.63	21.81	26.56	21.24	741.60	1.77E+08
16	Ghana	43.31	23.33	33.36	41.90	389.42	5.46E+08
17	Guyana	38.70	33.22	28.08	136.71	640.02	8.13E+07
18	Honduras	21.92	29.30	48.78	64.15	650.46	2.92E+08
19	India	28.27	26.10	45.64	2.32	335.02	2.32E+09
20	Indonesia	17.85	40.43	41.72	9.02	840.27	1.55E+09
21	Kenya	30.57	17.64	51.79	32.13	297.24	6.77E+08
22	Lesotho	18.00	39.74	42.26	75.54	432.31	1.16E+08
23	Madagascar	27.60	11.29	61.11	28.13	239.88	2.88E+08
24	Malawi	37.38	24.78	37.84	52.11	178.52	4.70E+08
25	Mali	40.24	17.49	42.26	48.70	288.74	4.40E+08
26	Mauritania	37.47	24.41	38.12	113.58	626.51	2.69E+08
27	Morocco	19.22	28.87	51.91	34.16	1238.35	6.84E+08
28	Nepal	43.83	20.58	35.59	20.87	191.36	4.46E+08
29	Niger	39.48	17.59	42.93	39.32	224.11	3.73E+08
30	Pakistan	25.76	24.65	49.59	10.22	441.82	1.61E+09
31	Philippines	21.61	32.83	45.57	18.68	869.05	1.05E+09
32	Senegal	19.89	23.54	56.57	74.73	636.71	6.35E+08
33	Swaziland	11.21	42.75	46.04	60.20	1490.00	5.78E+07
34	Syrian Arab Republic	32.43	20.51	47.06	30.79	909.85	7.44E+08
35	Vanuatu	16.71	11.72	71.57	269.38	1283.71	4.17E+07
36	Vietnam	31.78	27.52	40.70	7.92	198.87	9.03E+08
37	Yemen, Rep.	23.07	27.88	49.05	17.62	381.68	1.71E+08

V. Results

This section will highlight some of the major results of the empirical analysis using the synthetic control.

5.1. Myanmar: Economic Sanctions

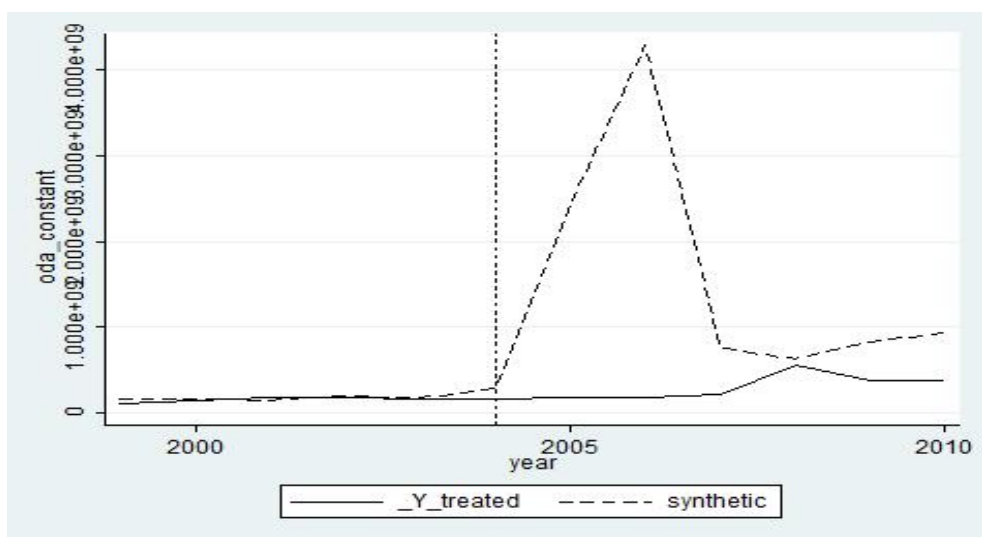
5.1.1. Synthetic Myanmar Without Trade-Related Predictor Variables

The resulting “synthetic” counter-factual of Myanmar consists of the following countries from the donor pool: the Central African Republic (32.7%) + Nigeria (32.9%) + Togo (34.5%). Also, the Root Mean Square Prediction Error was approximately 2.85×10^7 , which is considered to be within a reasonable range of error, considering the fact that net ODA received in constant 2012 USD was used for prediction as the dependent variable.

<Table 7> Predictor Balance

	Treated	Synthetic
agriculture	55.87	42.46
services	32.82	33.85
oda_pc	2.31	11.20
oda_constant(2003)	1.71E+08	1.76E+08

<Graph 4>



<Table 8>

Period	Year	Synthetic	Treated	Gap
Pre-Sanctions	1999	163,200,000	114,000,000	49,200,000
	2000	158,900,000	147,000,000	11,900,000
	2001	155,300,000	187,000,000	-31,700,000
	2002	200,300,000	179,000,000	21,300,000
	2003	176,000,000	171,000,000	5,000,000
Sanctions	2004	293,200,000	158,000,000	135,200,000
	2005	2,420,000,000	179,000,000	2,241,000,000
	2006	4,294,000,000	175,000,000	4,119,000,000
	2007	762,900,000	220,000,000	542,900,000

	2008	627,100,000	561,000,000	66,100,000
	2009	834,500,000	383,000,000	451,500,000
	2010	934,900,000	376,000,000	558,900,000
Total (2004-2010)		10,166,600,000	2,052,000,000	8,114,600,000

(constant 2012 US\$)

In conclusion, given the principle of “equity among recipient countries” and related indicator targeting approach, the total aid volume of the Synthetic Myanmar during the sanctions period represents the amount of ODA that the recipient country should have received since it corresponds to the actual needs of Myanmar without sanctions. The gap between the size of ODA treated unit received and what synthetic unit would have received, USD 8,114,600,000, provides an estimate for how much more should be given to Myanmar in order to ensure an “equitable” share of aid among priority countries in Asia (how to reflect such gap when determining the subsequent size of ODA will be examined in more details in “Discussion” section).

5.1.2. Synthetic Myanmar With Trade-Related Predictor Variables

The resulting “synthetic” counter-factual of Myanmar is made up of the following countries from the donor pool: Burundi (22%) + Sierra Leone (15.6%) + Solomon Islands (62.2%). Also, the Root

<Table 5>

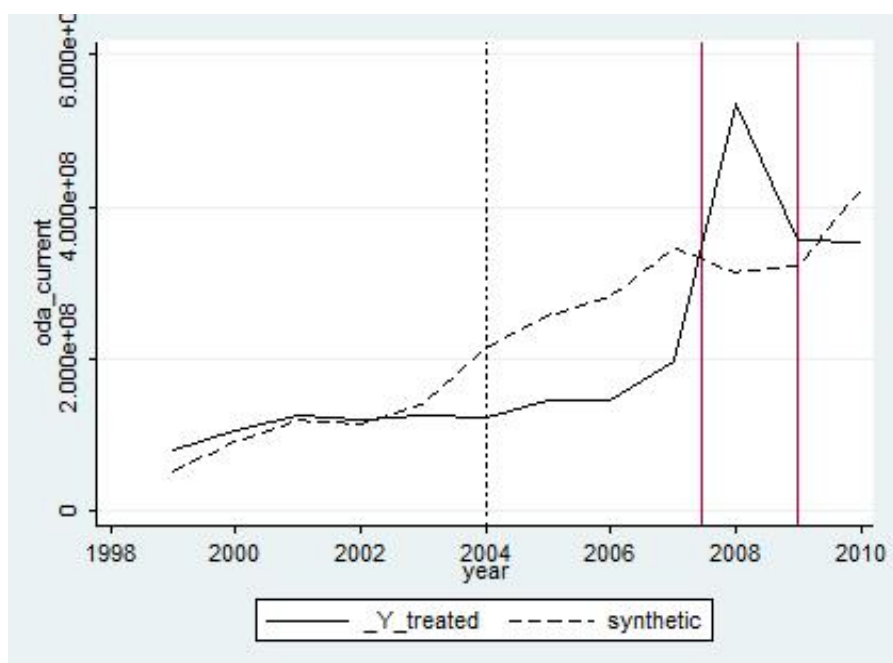
	Donor Pool Countries	Averages (1999-2003)					ODA (2003)
		Agriculture (% of GDP)	Industry (% of GDP)	Services (% of GDP)	Export Volume Index	Import Volume Index	
1	Armenia	26.60	37.71	35.69	157.14	114.85	2.54E+08
2	Bangladesh	22.63	23.67	53.70	98.30	103.88	1.39E+09
3	Benin	26.03	32.41	41.57	114.16	115.65	3.00E+08
4	Bolivia	15.13	29.26	55.61	108.04	98.13	9.38E+08
5	Burundi	46.91	16.67	36.42	84.97	91.57	2.28E+08
6	Cabo Verde	11.69	20.37	67.94	99.92	112.36	1.47E+08
7	Cambodia	36.76	23.50	39.74	125.59	118.52	5.18E+08
8	Cameroon	22.51	32.67	44.82	107.24	115.34	8.86E+08
9	Congo, Rep.	6.40	64.68	28.92	98.15	135.50	6.92E+07
10	Djibouti	3.55	15.61	80.84	109.06	101.63	7.95E+07
11	Egypt, Arab Rep.	16.68	33.57	49.74	105.60	96.85	1.02E+09
12	El Salvador	9.98	31.90	58.12	101.06	101.89	1.92E+08
13	Ethiopia	44.76	13.14	42.10	99.18	141.97	1.63E+09
14	Georgia	22.35	23.37	54.28	111.09	119.28	2.30E+08
15	Ghana	39.62	28.17	32.21	96.38	106.58	9.83E+08
16	Guinea	22.76	33.12	44.11	102.23	96.20	2.54E+08
17	Guyana	31.66	28.74	39.60	100.86	101.20	9.61E+07
18	Honduras	14.52	31.13	54.34	119.22	107.07	3.94E+08
19	India	22.28	25.70	51.93	110.44	106.54	7.30E+08
20	Indonesia	16.23	44.79	38.98	99.87	90.26	1.77E+09
21	Kenya	30.85	17.19	51.97	120.21	102.77	5.23E+08
22	Kyrgyz Republic	37.29	26.19	36.52	96.84	104.64	2.00E+08
23	Lao PDR	45.31	19.44	35.25	97.73	92.88	3.01E+08
24	Madagascar	29.60	14.47	55.93	99.77	91.23	5.46E+08
25	Malawi	37.62	17.56	44.82	121.43	122.94	5.18E+08
26	Moldova	25.69	22.51	51.79	134.56	129.55	1.22E+08
27	Morocco	16.56	28.03	55.41	101.88	99.87	5.73E+08
28	Myanmar	55.87	11.31	32.82	130.51	102.23	1.25E+08
29	Nepal	39.18	19.59	41.23	87.82	99.80	4.67E+08
30	Nicaragua	19.00	23.61	57.39	113.34	105.86	8.43E+08
31	Nigeria	37.27	39.64	23.09	101.79	109.35	3.08E+08
32	Pakistan	24.75	23.77	51.48	110.82	104.09	1.07E+09
33	Papua New Guinea	37.64	38.51	23.85	92.49	103.58	2.20E+08
34	Philippines	13.65	34.23	52.12	105.78	113.70	7.22E+08
35	Rwanda	37.12	13.80	49.08	131.13	121.49	3.35E+08
36	Sierra Leone	53.66	16.52	29.82	373.69	153.24	3.37E+08
37	Solomon Islands	33.10	12.50	54.40	86.34	94.17	6.01E+07
38	Tanzania	33.09	20.31	46.60	118.55	110.76	1.73E+09
39	Uganda	29.72	22.75	47.53	116.08	91.03	9.98E+08
40	Vanuatu	26.97	10.42	62.61	92.31	108.60	3.28E+07
41	Zambia	18.24	26.49	55.27	126.45	120.14	7.75E+08

Mean Square Prediction Error was approximately 1.62×10^7 . which can be also considered to be within a reasonable range of error, given that the net ODA received in its absolute amount (current USD) was used for the prediction as a dependent variable. In addition, the following table called “predictor balance” compares the averaged values of predictors for both treated and control unit, respectively and demonstrates estimates of similar magnitude. In other words, as shown in the table below, little notable difference has been observed among the treated and the synthetic units regarding the key determinants of a country’s economy.

<Table 9>

Predictors	Treated	Synthetic
agriculture	55.87393	39.37558
industry	11.30703	14.0536
services	32.81904	46.57083
import_vol_index	102.2302	102.8053
export_vol_index	130.506	130.8594
oda_current(2003)	1.25×10^8	1.41×10^8

<Graph 5>



<Table 10>

Period	Year	Synthetic	Treated	Gap
Pre-Sanctions	1999	52,768,380	81,100,000	- 28,331,620
	2000	91,303,980	106,000,000	- 14,696,020
	2001	119,700,000	126,000,000	- 6,300,000
	2002	114,200,000	119,000,000	- 4,800,000
	2003	140,600,000	125,000,000	15,600,000
Sanctions	2004	215,000,000	123,000,000	92,000,000

	2005	257,300,000	145,000,000	112,300,000
	2006	282,200,000	146,000,000	136,200,000
	2007	345,100,000	196,000,000	149,100,000
	2008	314,500,000	534,000,000	-219,500,000
	2009	322,600,000	356,000,000	- 33,400,000
	2010	423,000,000	355,000,000	68,000,000
Total		2,678,272,360	2,412,100,000	266,172,360

In conclusion, the magnitude of the gap between the synthetic unit and treated unit regarding the aggregate amount of ODA received during the sanctions period is estimated to be 266,172,360 USD. The reversal in the trends of the synthetic and treated units during 2008-2009 is likely to be due to the fact that in 2008 China provided an aid with the total amount of \$4,365,419.57 (2009 USD) to Myanmar for emergency relief. To be more precise, in May 2008, China announced an additional 30 million Yuan donation for cyclone relief in Myanmar. This comes after previous donations from the Chinese government and Red Cross Society of China earlier in the month (Li, 2008).

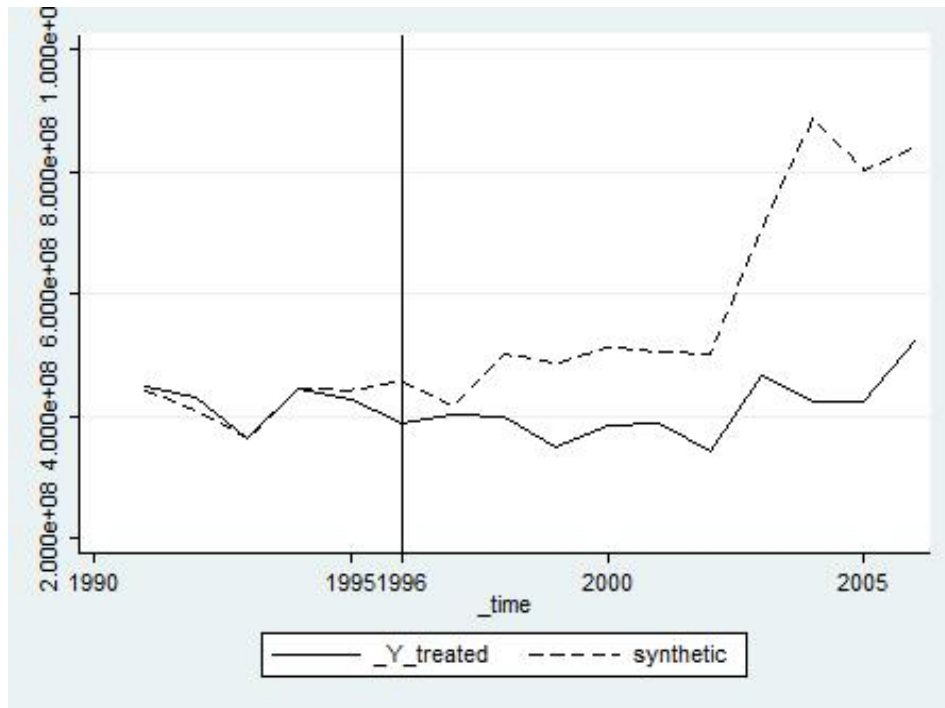
5.2. Nepal: Civil War

The resulting “synthetic” counter-factual of Nepal is made up of the following countries from the donor pool: Georgia (14.3%) + Ghana (27.4%) + India (0.3%) + Niger (49%) + Vietnam (9%). Also, the Root Mean Square Prediction Error was approximately $1.45e+07$, which is also considered to be within a reasonable range of error, given that the net ODA received in its absolute amount (current USD) was used for the prediction as a dependent variable. In addition, the following table called “predictor balance” compares the averaged values of predictors for both treated and control unit, respectively and demonstrates estimates of similar magnitude. In other words, as shown in the table below, little notable difference has been observed among the treated and the synthetic units regarding the key determinants of a country’s economy.

<Table 11> Predictor Balance

	Treated	Synthetic
agriculture	43.83	41.54
industry	20.58	20.69
services	35.59	37.77
oda_pc	20.87	34.50
gdp_pc_current	191.36	341.47
oda_current(1994)	4,460,000	4,460,000

<Graph 6>



<Table 12>

Period	Year	Synthetic	Treated	Gap
Pre-Civil War	1991	450,500,000	448,800,000	1,700,000
	1992	403,700,000	430,100,000	- 26,400,000
	1993	379,400,000	362,600,000	16,800,000
	1994	446,000,000	445,900,000	100,000
	1995	421,400,000	428,800,000	- 7,400,000
Civil War	1996	435,700,000	388,500,000	47,200,000
	1997	427,900,000	401,900,000	26,000,000
	1998	476,000,000	400,800,000	75,200,000
	1999	426,200,000	348,400,000	77,800,000
	2000	446,000,000	386,100,000	59,900,000
	2001	478,200,000	389,700,000	88,500,000
	2002	500,700,000	342,500,000	158,200,000
	2003	699,100,000	466,600,000	232,500,000
	2004	870,300,000	425,100,000	445,200,000
	2005	790,800,000	424,100,000	366,700,000
	2006	828,500,000	526,600,000	301,900,000
Total (1996-2006)		6,379,400,000	4,500,300,000	1,879,100,000

In conclusion, as pointed out in discussing the major results of Myanmar's case, given the principle of "equity among recipient countries" and related indicator targeting approach, the total aid volume of the Synthetic Nepal during the civil war period represents the amount of ODA that the recipient country should have received since it corresponds to the actual needs of Nepal were it not for the decade-long internal conflict. In a similar vein, the gap between the size of ODA treated unit received and what synthetic unit would have received, USD 1,879,100,000 provides an estimate for how much more should be given to Nepal in order to ensure an "equitable" share of aid among Korea's priority partner countries in Asia.

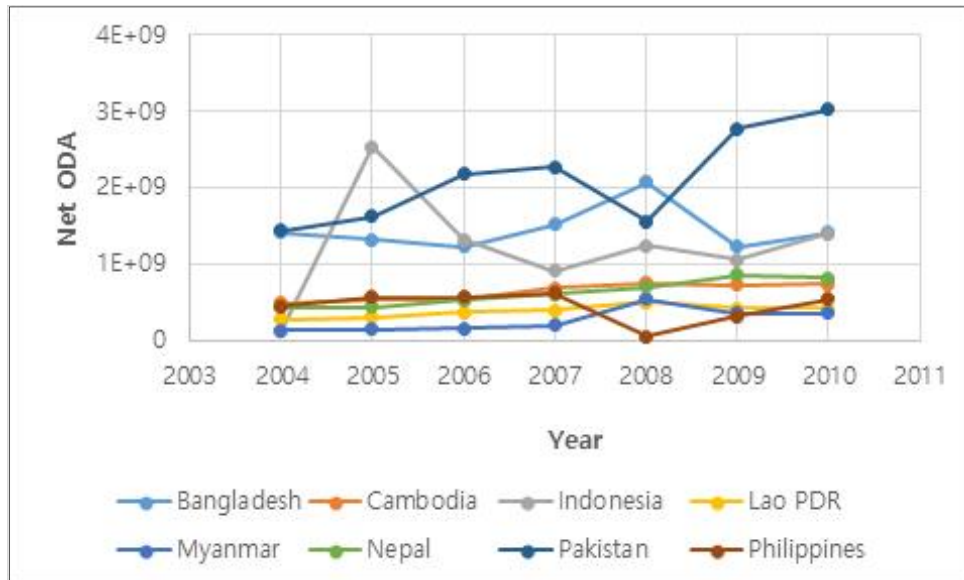
The next section will primarily deal with two issues. First, we will briefly discuss the credibility of the results obtained from the synthetic control analysis by comparing the trends of net ODA received in other countries in the donor pool during the treatment period of Myanmar and Nepal, respectively. That is, we will see whether the trajectory of the net ODA projected by the synthetic unit in each case is reasonable, given that no other notable spikes or dips have been observed in other countries that are included in the donor pool and within geographical vicinity—since one of the primary criteria in shaping aid policies and related resource allocation is geographical location (in the context of this paper, that will be Asia). Secondly, a set of guidelines for how to reflect the estimated results

regarding ODA and relevant policy implications will be discussed.

VI. Discussion & Policy Recommendations

To check whether the trend of net ODA volume projected by the synthetic control unit is plausible, we will first examine the trend of net ODA received in other Asian countries from the donor pool of Myanmar: Bangladesh, Cambodia, Indonesia, Lao PDR, Nepal, Pakistan, and Philippines. More specifically, we would like to know whether getting the ODA volume higher than what Myanmar actually received as its synthetic unit has projected is possible (except for 2008-2009 period when the aid volume actually received by Myanmar was higher than that of the synthetic unit due to the “external shock” explained above). In order to ascertain such plausibility, it is necessary to see whether the actual amounts of aid received by other Asian countries with similar country characteristics during Myanmar’s sanctions period generally display higher levels of aid volume. Admittedly, there are some ups and downs in the trajectory of each individual country, but the following graph suggests that overall, other Asian countries from the donor pool “actually” received higher levels of ODA than that of Myanmar.

<Graph 7>



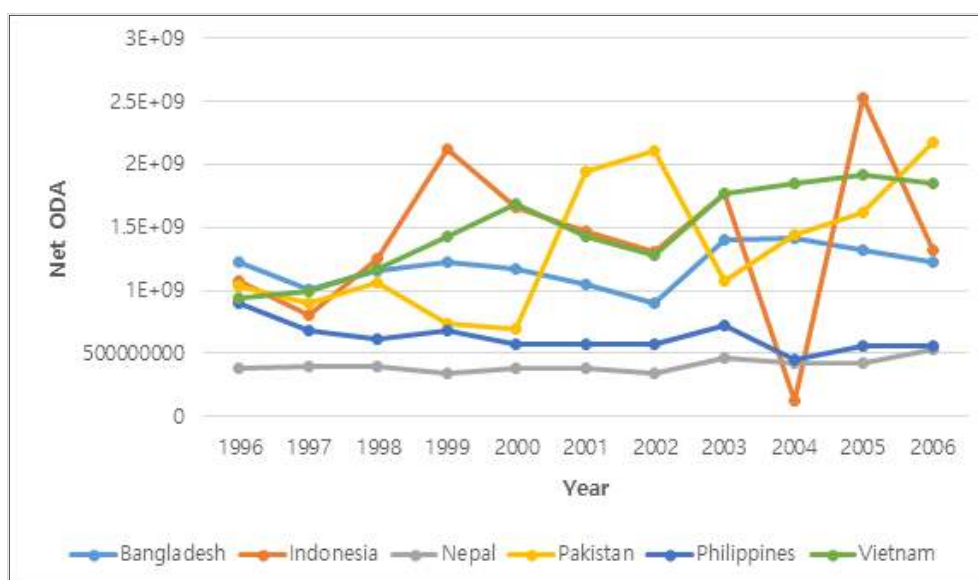
In other words, this data trend indicates that donors could have given greater amount of ODA to Myanmar just as its synthetic unit predicts.¹⁰⁾ Based on this idea, this paper has ultimately sought to assess the magnitude of the estimated difference between the treated and synthetic units.

Likewise, we will take a look at whether the projection of aid volumes represented by “Synthetic” Nepal—whose values are consistently greater than what Nepal actually received during the civil war period—is plausible. In Nepal’s donor pool, there are six Asian

10). Philippines shows a sharp decline during 2008, but except for that, it generally demonstrates higher levels of aid volume aid than that of what Myanmar received during the sanctions period.

countries: Bangladesh, Indonesia, Nepal, Pakistan, Philippines, and Vietnam. As in the case of Myanmar, the level of ODA received by those countries during the 1996-2006 period indicate that Nepal could have gotten larger volume of ODA during 1996-2006, were it not for the armed internal conflict, as the synthetic unit suggests.¹¹⁾

<Graph 8>



Another issue is how we can consider the principle of equity and needs measured through the synthetic control methodology when determining the aid volume in such a way that it can work to remedy the aid foregone (which could have contributed to Myanmar and Nepal's economic growth as briefly discussed above).

11) Indonesia shows a sharp decline during 2004, but except for that, it generally demonstrates higher levels of aid volume aid than that of what Nepal received during the period of internal conflict.

Getting back to this paper's more specific concern, we are interested in how this equity-based assessment using synthetic control method can subsequently serve as an important standard for Korean government and relevant agencies in estimating a fair and an equitable size of ODA for the least developed countries (LDCs) like Myanmar and Nepal.

The strategic approach taken to reflect the gap estimated by the synthetic control method can be briefly described as follows: we will observe how much proportion of net ODA received by each country during the intervention period had been provided by the Republic of Korea.

Then, I will use the observed annual proportions as a basis for how much of the aid "foregone" or the gap should be provided by Korean government's bilateral aid (eg. adding the estimated aid volume to subsequent ODA allocation). Basically, we argue that the needs unfulfilled due to specific types of economic-political incidents should be fulfilled by donor countries based on proportional composition of the actual net ODA delivered by donors to Myanmar and Nepal, respectively.

There are two important assumptions underlying the aforementioned estimation process and its policy implications. First, it is assumed that DAC donor countries have formulated their aid policies in such a way that they would fulfill the "gap" created by

sanctions or civil wars in a same proportion (%) as its aid volume during the intervention period accounted for, out of the total net ODA actually received by Myanmar during that phase.

Also, it is assumed that other factors except sanctions or civil wars have not been considered in determining how much “unfulfilled needs” each DAC donor would or should provide. In this regard, under these assumptions, the following frameworks in tables serve as an *equity-based normative mapping* of “unfulfilled” aid needs to be delivered by each relevant donor country.

Now, more specifically, the following sections will show how the aforementioned approach has been applied to each case study.

6.1. Myanmar

I examined the distribution of bilateral aid—in % of net ODA—given to Myanmar by DAC donors during the sanctions period, 2004-2010. Then, I induced the aid volume to be “covered” by Korea based on the proportion (%) of its ODA out of the total bilateral aid delivered to the recipient country during the intervention period. In more technical terms, the gap between aid volume of the synthetic unit and that of treated unit was multiplied by the percentage (proportion) estimated above.

The following two tables summarize the process and results of the estimation. Specifically, <Table 13> shows the estimation of the

synthetic unit constructed without trade-related predictor variables, while, <Table 14> represents the estimation of the Synthetic Myanmar constructed with trade-related predictors.

<Table 13>

Year	2004	2005	2006	2007	2008	2009	2010	Total
DAC Donor Countries	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	
Australia	8	8	4	7	9	5	12.4	
EU	9	12	8	14	11	22	15.8	
France	2	1	1	1	1	1	0.6	
Japan	22	17	21	16	8	13	13.2	
Korea Rep.	2	6	6	0.3	1	1	0.9	
Sweden	3	3	3	6	4	5	3.4	
United States	5	3	8	8	13	10	8.7	
United Kingdom	10	8	9	9	15	15	12.4	
Denmark	1	2	2	4	4	3	3.1	
Canada	1	0	0	0	4	1	0.2	
Germany	4	3	4	3	3	3	5.1	
Ireland	1	1	1	1	1	0	0.2	
Others*	34	37	34	32	26	22	24	
Net ODA Gap (USD)	135,200,000	2,241,000,000	4,119,000,000	542,900,000	66,100,000	451,500,000	558,900,000	8,114,600,000
Korea Rep. Proportion	2,704,000	134,460,000	247,140,000	1,628,700	661,000	4,515,000	5,030,100	396,138,800

<Table 14>

Year	2004	2005	2006	2007	2008	2009	2010	Total
DAC Donor Countries	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	
Australia	8	8	4	7	9	5	12.4	
EU	9	12	8	14	11	22	15.8	
France	2	1	1	1	1	1	0.6	
Japan	22	17	21	16	8	13	13.2	
Korea Rep.	2	6	6	0.3	1	1	0.9	
Sweden	3	3	3	6	4	5	3.4	
United States	5	3	8	8	13	10	8.7	
United Kingdom	10	8	9	9	15	15	12.4	
Denmark	1	2	2	4	4	3	3.1	
Canada	1	0	0	0	4	1	0.2	
Germany	4	3	4	3	3	3	5.1	
Ireland	1	1	1	1	1	0	0.2	
Others*	34	37	34	32	26	22	24	
Net ODA Gap (USD)	92,000,000	112,300,000	136,200,000	149,100,000	-219,500,000	-33,400,000	68,000,000	304,700,000
Korea Rep. Proportion	1,840,000	6,738,000	8,172,000	447,300	- 2,195,000	- 334,000	612,000	15,280,300

<Table 15>

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
DAC Donor Countries	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	% of net ODA	
Japan	22.9	21.4	14.2	18.8	25.9	21.7	28.5	13	13.3	14.9	7.9	
Korea Rep.	0.3	0.3	0.9	1.6	0.6	0.4	0.6	0.3	0.4	0.4	0.4	
Ireland	0.1	0.1	0	0	0	0	0.1	0.1	0.1	0.1	0.2	
Germany	6.6	6.1	6.1	6.4	5.6	9.7	10.1	13.5	12.4	14.9	6.3	
France	0.5	0.9	0.8	0.6	0.5	-0.2	-0.6	-0.2	-0.5	-0.5	-0.5	
Finland	1.4	1.7	3.3	1.6	1.4	1.2	1.6	1.1	1.5	2.1	1.5	
Canada	1.4	1.2	1.5	1.3	1.1	1.1	1.2	1.3	1.8	2.4	2.1	
Denmark	5.9	4.5	5.7	6.8	6.5	6.7	7.4	8.6	8.1	6.5	6.2	
EU	1.6	2	1.1	2.9	3.8	2.8	3.9	3.5	5.2	2.3	4.6	
Australia	1.3	1.6	1.1	1.3	1.1	1.2	1	0.7	0.9	0.7	0.5	
Austria	0.6	0.3	0.4	0.5	0.3	0.3	0.5	0.5	0.4	0.3	0.4	
Belgium	0	-0.1	-0.1	0.6	0	0.6	0	0.4	-0.1	-0.1	0.1	
New Zealand	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.2	
Norway	2.9	1.9	2.2	2.1	2.3	2.9	3.8	4.3	5.4	5.9	7.8	
Netherlands	2.9	2.7	2.9	1.8	1.5	3.4	2.1	2.1	3.3	2.8	0.8	
Luxembourg	0.1	0.3	0.1	0.2	0.1	0	0	0.1	0.3	0.2	0.2	
Sweden	0.4	0.3	0.3	0.3	0.3	3.5	1.1	0.3	0.2	0.3	0.4	
Switzerland	3.8	2.8	3.3	3.9	3	3.2	4.2	3.1	3.7	3.8	3.3	
United States	3.9	5.2	4.2	4.8	4.1	5.2	9.5	8.1	8.3	12.3	11.7	
United Kingdom	6	7.1	7	7.6	6	8.5	10.8	11.4	15.5	14.5	14.2	
Others	37.4	39.7	45	36.8	35.8	27.5	13.9	27.6	19.6	15.8466	31.7	
Net ODA Gap (USD)	47,200,000	26,000,000	75,200,000	77,800,000	59,900,000	88,500,000	158,200,000	232,500,000	445,200,000	366,700,000	301,900,000	1,879,100,000
Korea Rep. Proportion	141,600	78,000	676,800	1,244,800	359,400	354,000	949,200	697,500	1,780,800	1,466,800	1,207,600	8,956,500

6.2. Nepal

Through the same estimation process, a total of 8,956,500 USD was estimated as aid that should be provided additionally in subsequent ODA appropriation among the LDCs. The following table shows the needs for ODA that should be fulfilled by Korean government:

6.3. Policy Recommendation

6.3.1. Overview of Current Aid Allocation Standards/Policies

In their report on Korea's ODA for 2016, the Ministry of Foreign Affairs and the Ministry of Strategy and Finance—the two major Korean governmental entities in charge of aid policy-making—and other related agencies laid out their key strategic approaches and standards for allocating financial resources of ODA. In particular, the guiding policies for Asia suggested a few key criteria on how to distribute ODA resources: demands for aid of recipient countries, prospects of economic cooperation, and aid effectiveness based on the development of particular sector(s) in recipient countries, among others (Committee for International Development Cooperation, 2015).

Broadly speaking, the overarching framework for evaluating the aid policies—including whether the “adequate” amount of ODA has been delivered proper recipients—pertains to the following set of OECD DAC's criteria:

<Table 16>

Relevance	The extent to which the aid activity is suited to the priorities and policies of the target group, recipient and donor.
Effectiveness	A measure of the extent to which an aid activity attains its objectives.
Efficiency	Efficiency measures the outputs—qualitative and quantitative— in relation to the inputs.
Impact	The positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended.
Sustainability	Sustainability is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn.

(OECD, DAC Quality Standards for Development Evaluation)

Yet, as mentioned in the beginning, those five criteria that have been frequently used to evaluate whether an adequate amount of aid has been given to different recipient countries, do not consider equity—to be more precise, the needs assessment based on the second principle of equity—as an important standard to ensure that countries with political-economic historical incidents that prevented them from receiving the “proper” amount of aid corresponding to their needs, have received as much aid as they need.

6.3.2. Current Aid Statuses of Myanmar and Nepal in Korea’s ODA

Based on 2013-2014 average provided by the OECD, the following table shows top ten recipients of Korea’s gross ODA in

USD million (OECD, 2014):

<Table 17>

1	Vietnam
2	Afghanistan
3	Tanzania
4	Cambodia
5	Bangladesh
6	Mozambique
7	Philippines
8	Sri Lanka
9	Ethiopia
10	Indonesia

So, where does Myanmar and Nepal stand in terms of gross ODA in recent years? Specifically, Myanmar ranked 36th in 2011 with approximately 4.8 million USD, while recording 32nd in 2012 with USD 6 million. After major embargos on Myanmar got lifted, the country gradually opened itself up to international community and ODA to Myanmar has increased accordingly. Moreover, the upward trend is likely to continue since it has been predicted that the ranking will continue to go up to 21st and 18th in 2014 (Lee, 2015).

However, if we compare Myanmar's aid volume among Asian recipient countries, despite the fact that it has been designated as one of Korea's ODA priority partner countries in Asia, the country's ranking has remained low. For instance, ODA received by Myanmar

ranked 15th in two consecutive fiscal years, 2011-2012. In addition, the ranking of Myanmar in 2013 went down to 12th, while its potential ranking in 2014 was lower than previous years—10th, recording one of the lowest rankings among those who have been recently selected as priority partner countries in Asia.

Meanwhile, Nepal, a country located in the South Asia—one of the poorest regions of the world—is an important partner for Korea in development cooperation. While people in South Asia account for 23% of the world's population, GDP per capita of the region remained at the level of USD 1,402 as of 2011.

As such, the region has been increasing in its priority as a recipient; South Korea, too, have designated Nepal as one of its priority partner countries in Asia as mentioned earlier. Also, Korean government have raised concerns about how to address the development needs of the recipient country. More specifically, the government and relevant ministries have pronounced that they will give more due consideration to specific country characteristics such as historical, geopolitical, and socio-cultural factors. Yet, the approach remains at program-level, mostly from the standpoint of aid program coordination and coherence.¹²⁾ In a similar vein, even with greater emphasis placed on one of South Asia's least developed countries, the

12). See *Country Partnership Strategy for the Government of Nepal 2013-2015*.

amount of aid allocated to Nepal has fallen short of reflecting such increasing importance, even after years of giving no loans at all in the early 2000s, as shown in the table below. Not surprisingly, the level of ODA during that period—which overlaps with that of Nepal’s civil war—recorded one of lowest levels of aid given by Korean government to the recipient.

<Table 18>

Year	Grants	Loans	Total ODA
1987~1999	6.92	7.71	14.63
2000	1.08	1.25	2.33
2001	1.08	0.54	1.62
2002	1.69	0.44	2.13
2003	1.53	-	1.53
2004	1.68	-	1.68
2005	1.78	-	1.78
2006	2.04	-	2.04
2007	4.98	-	4.98
2008	5.25	-0.56	4.69
2009	3.99	14.08	18.07
2010	7.91	12.87	20.78
2011	11.67	9.3	20.97
2012	12.15	8.62	20.77
2013	16.77	0.32	17.09

(Million USD, OECD Stats)

More importantly, the Country Partnership Strategy for the Government of Nepal the level of aid will retain its current level for

the next fiscal years, considering the changes in the aid environment and the development needs of other South Asian countries.

Given these considerations, policy implications of adopting the equity-based approach to needs assessment can be postulated as follows: First of all, changes in aid volume by considering needs assessed using the synthetic control method might affect Myanmar's ranking(s) in terms of gross ODA USD in its post-sanctions period. Secondly, as for Nepal, based on the estimation presented above¹³⁾, it is possible that some modifications to budget appropriations for Nepal's ODA for 2016-2020 period might become necessary to reflect the "unfulfilled" needs during the civil war. Admittedly, the results obtained from the analysis of this paper might not drastically increase the amount of ODA given to Nepal, but it is critical to understand the importance of equity-based needs assessment, along with current standards for determining the aid volume for the most impoverished Asian countries.

VII. Conclusion

In the arena of international aid, the rules of distribution mostly focuses on "aid effectiveness" or even when considering equity

13). As mentioned above, the estimation process and results are intended to serve as more of normative framework, rather than actual policy mapping out of financial resources for ODA.

issue, donors are concerned with equity *within* those developing countries—that is, how those given resources are distributed to different social classes in the country. However, equity *among* countries has been barely regarded as one of principal criteria for the aid allocation mechanisms. In a similar vein, a recent study designed to assess the incorporation of equity into donors' aid policies and planning discovered that the concept is a “highly visible commitment” for donor countries, but that equity and related terms are used in a “vague” fashion, often quite “superficially or more as a ‘buzzword’” (O'Meara, 2008; Jones, 2009). Overall, the assessment revealed that the extent to which equity standard has been integrated into donors' aid distribution systems is “shallow”; Indeed, specific frameworks and underlying rationales have been rarely addressed. Likewise, the analysis by Cling et al. (2005) regarding the 2006 World Development Report (on equity and development) points out that the institution's report presents new concepts but falls short of proposing the concrete new policy frameworks based on those concepts and is “seemingly more of a review of operational knowledge than an attempt to draw on the concept of equity to forge a new policy agenda” (Jones, 2009).

However, as the in-depth examination above demonstrate, along with the determinants of aid effectiveness as standards to target the proper amount of development assistance, the second principle of

equity should be considered in order to more accurately—and more legitimately—assess the needs of developing countries who suffered economic sanctions or civil wars—major deterrents for delivering and receiving ODA. In particular, needs assessment for those one of the worst-off developing countries becomes a critical task. To reemphasize the importance of needs assessment and how the second principle of equity provides a solid philosophical and political foundation for conducting such assessment, let me reiterate the words of Jones (2009) regarding the second principle of equity:

This [principle of equity] means distribution of necessary goods on the basis of people's need, that is, proportional to the extent that they are missing them and nothing else. These are not things that should be 'earned' or 'deserved' through hard work, and lacking them can be seen as an outcome that is so bad that nobody deserves or merits it.

As such, it is crucial to understand this equity principle in such a way that it indeed calls for more comprehensive yet discrete needs assessment. In this respect, we conducted the empirical analysis using synthetic control method and results clearly indicated higher level of net ODA that the two case countries would have received if they had not suffered from historical-political incidents—economic sanctions and civil war, respectively—that often serve as significant

obstacles to getting the necessary amount of aid. Specifically, in the case of Myanmar (whose synthetic unit is constructed without trade-related predictors) the gap between the size of ODA treated unit received and what synthetic unit would have received amounted to USD 8,114,600,000, while the gap between the synthetic unit and treated unit regarding the aggregate amount of ODA received during the sanctions period is estimated to be USD 266,172,360. In the case of Nepal, the gap between the size of ODA treated unit received and what synthetic unit would have received reached USD 1,879,100,000.

Based on these results of the analysis, this paper suggested some normative frameworks to estimate the amount of ODA “foregone” and how much of it has to be provided by South Korea as a DAC donor country. In the meantime, more practical guidelines and related standards will have to be developed by Korean government for its aid allocation system.

Ultimately, the disparity in the level of aid diagnosed through needs assessment should be reflected when determining the aid volume for countries such as Myanmar and Nepal in subsequent years. Accurately capturing the needs (aid) foregone and reflecting them by incorporating the principle of equity will be critical in establishing “Country Partnership Strategy” (CPS) for priority partner countries.

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